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## **A Train Journey through the English Health Divide: Topological Map**

England has some of the largest spatial inequalities in health Europe – greater, for example, than those that currently exist between the former East and West of Germany (Bambra et al, 2014). People in the North of England are consistently found to be less healthy than those in the South - across all social classes and amongst both men and women (Dorling, 2010). The reasons for this are both compositional and contextual (Macintyre et al, 2002), reflecting uneven economic and social geographies (Dorling, 2010). It is also a longstanding health gap dating back to at least the 19<sup>th</sup> century (Bambra et al, 2014).

It is popular to map these health inequalities using thematic choropleth, cartogram, or topological techniques. Our graphics expand on the latter by visualising the health divide between the North and South of England using some familiar national train journeys. It uses average life expectancy at birth for both women (figure 1) and men (figure 2) (data from Public Health England, 2015; reproduced under the Open Government Licence) along the West Coast Mainline (WCM, 300 miles, London Euston to Carlisle), the East Coast Mainline (ECM, 335 miles, London Kings Cross to Berwick) and the Great Western Mainline (GWM, 300 miles, London Paddington to Penzance). The data is geo-referenced to each of the main stations along the routes using the relevant Local Authority (e.g. the data for Newark is for Nottinghamshire). Differently sized and coloured circles represent values above (large, green), around (medium, amber) or below (small, red) the English average of 79.4 years for men and 83.1 years for women.

The visualisations show very clearly the health divides within a comparatively small country, particularly between the North East and South East regions which have the lowest and highest life expectancies respectively for both men and women. There are gaps of 4 years for men and 5 years for women between the best Southern and worst Northern areas. It also demonstrates a socio-

spatial gradient with average life expectancy at birth decreasing the further north the journey takes. There are exceptions to this with some areas that, whilst “Northern” (e.g. Cheshire or North Yorkshire), have above average health outcomes, and others that whilst “Southern” have below average health outcomes (e.g. Bristol or Peterborough). The graphic therefore also “problematise” the consistency of the English health divide and exposes inequalities *within* the North and the South as well as *between* them. Reducing these spatial inequalities is a journey that urgently needs to be taken but one which will not be straightforward given the economic and social geographies underpinning them (Dorling, 2010; Whitehead et al, 2014).

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